



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/569,171	02/22/2006	Stephan jo Cecile Henri Theeuwen	NL 031066 US1	7877
65913	7550	08/05/2008		
NXP, B.V. NXP INTELLECTUAL PROPERTY DEPARTMENT M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131				
EXAMINER				
HO, ANTHONY				
ART UNIT		PAPER NUMBER		
2815				
NOTIFICATION DATE		DELIVERY MODE		
08/05/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary

Application No.

10/569,171

Applicant(s)

THEEUWEN ET AL.

Examiner

ANTHONY HO

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) 5, 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 10 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This is in response to amendment to application no. 10/569,171 filed on June 23, 2008.

Claims 1-10 and 12 are presented for examination.

Claims 5 and 8-9 stand withdrawn.

Claim 11 has been cancelled.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-4, 6-7, 10 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 recites the limitation "wherein the shield has a two-stepped structure in the extension area comprising a first step and a second step, the first step and the second step having a combined height shorter than a height of the gate electrode," but there is no support for this limitation in the originally filed specification. For example, page 5, line 29 – page 6, line 2 in the originally filed specification describes in detail the stepped shield structure 50. However, there is no mention that "the first step and the second step having a combined height shorter than a height of the gate electrode."

Even if applicant was relying on their filed drawings for support, Figure 2 does not clearly show "the first step and the second step having a combined height shorter than a height of the gate electrode." It is unclear if the combined height of the first step and the second step is the same or shorter than the height of the gate electrode. Thus, the above limitation is being treated as new matter.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6-7, 10 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the first step and the second step having a combined height shorter than a height of the gate electrode," but it is unclear what the height is in reference to (i.e. where is this height being measured from?). Thus, one of ordinary skill in the art would not be able to define the metes and bounds of the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 10 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Van Den Heuvel (US PUB 2002/0102800).

Van Den Heuvel discloses an electronic device, comprising a LDMOS type transistor provided at a surface of a semiconductor substrate made of silicon, the transistor having a source (leftmost 11) and a drain (rightmost 11) that are mutually connected through a channel, which transistor is further provided with a gate electrode (center 11) and a shield (27) formed as a metal silicide present between the gate and the drain, which drain is provided with a drain extension extending in the substrate towards the channel, the drain having a contact, drain contact and gate being mutually separated through an extension area, wherein the shield has a two-stepped structure (i.e. Figure 9) *(the shield layer 27 has many microscopical steps, because of the slant angle, and the claimed invention does not specify how big the steps are – any one of the microscopical steps will be the first step and the second step and their combined height will clearly be smaller than the height of the gate electrode)* in the extension area, and a L-shaped spacer is present between the gate-electrode and shield (Figure 1; Figure 9; page 2 – page 3).

Claims 1, 3-4, 6-7, 10 and 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Baliga (US Patent 6,545,316).

Baliga discloses an electronic device and method of manufacturing the same, comprising a LDMOS type transistor provided at a surface of a semiconductor substrate made of silicon, the transistor having a source and a drain that are mutually connected through a channel, which transistor is further provided with a gate electrode and a shield formed as a metal silicide present between the gate and the drain, which drain is provided with a drain extension extending in the substrate towards the channel, wherein the drain extension is provided with a first and a second region, the first region having interfaces with the channel and the second region, the second region having an interface with a contact area within the drain, which first region has a higher dopant concentration than the second region (*see the transition region 710 having a higher doping concentration than the LDD region 708*), the ratio of the dopant concentrations in the first and second region is in the range of 1.2 to 2.5, the first region and interface between first and second region is substantially present within a shield area defined by a perpendicular projection of the shield on the substrate, the drain having a contact, drain contact and gate being mutually separated through an extension area, wherein the shield has a stepped structure in the extension area (Figure 9; column 14 – column 15). In regards to the two-stepped structure, the shield layer has many microscopical steps, because of the slant angle, and the claimed invention does not specify how big the

steps are – any one of the microscopical steps will be the first step and the second step and their combined height will clearly be smaller than the height of the gate electrode.

Claims 1, 10 and 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Applicant Admitted Prior Art (AAPA).

AAPA discloses an electronic device and method of manufacturing the same, comprising a LDMOS type transistor provided at a surface of a semiconductor substrate made of silicon, the transistor having a source and a drain that are mutually connected through a channel, which transistor is further provided with a gate electrode between the gate and the drain, which drain is provided with a drain extension extending in the substrate towards the channel, the drain having a contact, drain contact and gate being mutually separated through an extension area, wherein the shield has a two-stepped structure (*the shield layer has many microscopical steps, because of the slant angle, and the claimed invention does not specify how big the steps are – any one of the microscopical steps will be the first step and the second step and their combined height will clearly be smaller than the height of the gate electrode*) in the extension area (Figure 1; page 3 – page 4).

Response to Arguments

Applicant's arguments filed June 23, 2008 have been fully considered but they are not persuasive.

In response to applicant's argument that none of the cited references teach the limitation "the first step and the second step having a combined height shorter than a height of the gate electrode," examiner asserts, for example, Van Den Heuvel does disclose the limitation "the first step and the second step having a combined height shorter than a height of the gate electrode." Figure 9 of Van Den Heuvel shows the shield layer 27 has many microscopical steps, because of the slant angle, and the claimed invention does not specify how big the steps are – any one of the microscopical steps will be the first step and the second step and their combined height will clearly be smaller than the height of the gate electrode. Thus, the claimed invention is not patentably distinct over the "two-stepped" shield layer of Van Den Heuvel.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY HO whose telephone number is (571) 270-1432. The examiner can normally be reached on M-Th: 10:30AM-9:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. H./
Examiner, Art Unit 2815

/Jerome Jackson Jr./
Primary Examiner, Art Unit 2815